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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,038	10/12/2001	Douglas P. Brown	10150 (NCRC-0063-US)	3717

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EXAMINER

WOO, ISAAC M

ART UNIT	PAPER NUMBER
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2172

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DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PR24

Office Action Summary	Application No. 09/977,038	Applicant(s) BROWN ET AL.	
	Examiner Isaac M Woo	Art Unit 2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2001.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 9 and 10.
- 4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudhuri et al (U.S. Patent No. 5,960,423, hereinafter, "Chaudhuri").

With respect to claims 1, 17, 22 and 40, Chaudhuri discloses, the system, method and article for selecting a recommended index for a database system, means for adapted receiving a working load containing a set of queries of the database system, see (304, workload, fig. 2, 332, query work load, fig. 6, col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53); means for generating a set of candidate indexes for the set of queries, see (330, fig. 3, col. 7, lines 1-63, col. 16, lines 43-67 to col. 17, lines 1-53); candidate indexes (330, candidate index selection, fig. 3, fig. 6, col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53) based on one or more predetermined criteria (310, What-if indexes create and load manager, 320, cost evaluation tool, etc., fig. 3 , col. 10, lines 60-67 to col. 11, lines 1-59, used to

evaluate index, which are considered as predetermined criteria); and means for optimizer adapted to provide cost analysis (320) to generate a recommended index from the set of candidate indexes, see (302, fig. 3, selected index configuration, fig. 8, fig. 11, col. 6, lines 35-54, col. 20, lines 18-67 to col. 21, lines 1-57). Chaudhuri does not explicitly disclose the step of removing one or more candidate index. However, Chaudhuri discloses, Index selection tool 300 selects index configuration 302 based on the relative effectiveness among candidate index for database 210, see (col. 6, lines 35-45). Selecting index from candidate index, which means that selecting some of the candidate index and the index that are not selected from candidate index is removed or eliminated. Therefore, it would have been obvious to a person having ordinary skill in the art the time of the invention was made to include the step of removing one or more candidate index in the system of the Chaudhuri. In order to reduce workload load from the set of queries, removing the number of index provides the efficient query and saving searching time in the database system.

With respect to claim 2, Chaudhuri discloses, the set of queries comprises a set of SQL statements, see (col. 6, lines 3-10).

With respect to claims 3-4, Chaudhuri discloses, the optimizer used statistics is adapted to generate at least another recommended index from the set of candidate indexes, see (col. 7, lines 1-63, 302, fig. 3, selected index configuration, fig. 8, fig. 11, col. 6, lines 35-54, col. 20, lines 18-67 to col. 21, lines 1-57).

With respect to claim 5, Chaudhuri discloses, the statistics are based on a scan of a sample of one or more tables, the sample less than all the rows of the one or more tables, see (col. 7, lines 1-63).

With respect to claim 6, Chaudhuri discloses, user interface to receive an indication of a user-specified size of the sample, see (col. 6, lines 35-54, col. 20, lines 18-67 to col. 21, lines 1-57).

With respect to claim 7, Chaudhuri discloses, the one or more predetermined criteria comprises a threshold change rate, the first module adapted to eliminate one or more candidate indexes having a change rate exceeding the threshold change rate, see (col. 6, lines 35-54, col. 20, lines 18-67 to col. 21, lines 1-57).

With respect to claim 8, Chaudhuri discloses, eliminate a candidate index that is a subset of another candidate index, see (col. 6, lines 35-54, col. 20, lines 18-67 to col. 21, lines 1-57).

With respect to claim 9, Chaudhuri discloses, analysis module adapted to cooperate with the optimizer to generate the recommended index, see (col. 6, lines 35-54, col. 20, lines 18-67 to col. 21, lines 1-57).

With respect to claim 10, Chaudhuri discloses, the set of candidate indexes by identifying the candidate indexes from the set of queries and defining the set of queries in a database, see (330, candidate index selection, fig. 3, fig. 6, col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53).

With respect to claims 11-12, Chaudhuri discloses, access the database to retrieve and validate the candidate indexes, see (fig. 3, fig. 6, col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53).

With respect to claim 13, Chaudhuri discloses, user interface to receive user-specified one or more indexes, the optimizer adapted to generate a cost associated with a query plan based on the user-specified one or more indexes, see (col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53).

With respect to claim 14, Chaudhuri discloses, the system further comprising another module to collect statistics based on a sample of rows of one or more tables, a size of the sample based on the user-specified percentage value, see (col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53).

With respect to claims 15-16, Chaudhuri discloses, the system further comprising another module to collect statistics and hint based on a sample of rows of one or more

tables, a size of the sample based on the user-specified percentage value, see (col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53).

With respect to claim 18, Chaudhuri discloses, analysis module is adapted to submit candidate indexes to the optimizer, the optimizer adapted to determine the cost of one or more of the queries based on the candidate indexes, see (col. 7, lines 1-67 to col. 8, lines 1-8).

With respect to claims 19-21, Chaudhuri discloses, analysis module is adapted to submit candidate indexes to the optimizer, the optimizer adapted to determine the lowest cost of one or more of the queries based on the candidate indexes in the database system, see (col. 7, lines 1-67 to col. 8, lines 1-8).

With respect to claim 23-25 and 43, Chaudhuri discloses, applying a predetermined genetic algorithm to identify the lowest recommended index, see (col. 7, lines 1-67 to col. 8, lines 1-8).

With respect to claim 26-35, Chaudhuri discloses, graphical user interface screens displaying an activatable item to perform workload identification to identify the workload to save, test, compare cost, cost improve and analysis the workload into a database to receive user input for selecting the recommended index for displaying report, see (col. 4, lines 21-67 to col. 5, lines 1-55).

With respect to claims 36-39, Chaudhuri discloses, the optimizer is performed in a test system separate from the database system and importing the environment information of a parallel database system having plural access modules, see (col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53).

With respect to claims 41-42, Chaudhuri discloses, the system to eliminate a candidate index subset of another candidate index that has a change rate greater than a preset threshold, see (col. 5, lines 55-67 to col. 6, lines 54, col. 16, lines 43-67 to col. 17, lines 1-53).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Agrawal et al (U.S. Patent No. 6,513,029) discloses the system for index and materialized view selection wizard produces a fast and reasonable recommendation for a configuration of indexes, materialized views, and indexes on materialized views which are beneficial given a specified workload for a given database and database server. Candidate index obtained, and a joint enumeration of the combined materialized views and indexes is performed to obtain a recommended configuration. Thus, this can be used as another 103 reference.


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isaac M Woo whose telephone number is (703) 305-0081. The examiner can normally be reached on 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Breene can be reached on (703) 305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IMW
February 5, 2004


SHAHID ALAM
PRIMARY EXAMINER